collapse. It does not seem to be known in foreign countries, but in the British Isles is met with particularly on the west coasts of Ireland and Scotland, in Cumberland and Westmorland, and in small, scattered areas throughout the country. Sheep of all ages may be attacked, and the mortality may amount to 20 per cent. or even more.

Braxy is often a rapidly fatal disease. The animal goes off its feed, is restless, the belly swells, it falls on its side, becomes semi-comatose, and death soon ensues, the carcase having a characteristic odour. The disease prevails in several countries of northern Europe, and in the British Isles on the west coasts of Ireland and Scotland, central Wales, Westmorland and Northumberland, Cornwall, Wilts, and Gloucester. Sheep under one year are the chief sufferers.

A remarkable feature of both these (and certain other) diseases of the sheep is their seasonal prevalence; thus louping-ill and braxy are not met with during July and August, and the former is most prevalent from April to June, the latter from November to February.

In the case of louping-ill, for a long time the specific cause remained a mystery, carcase after carcase examined

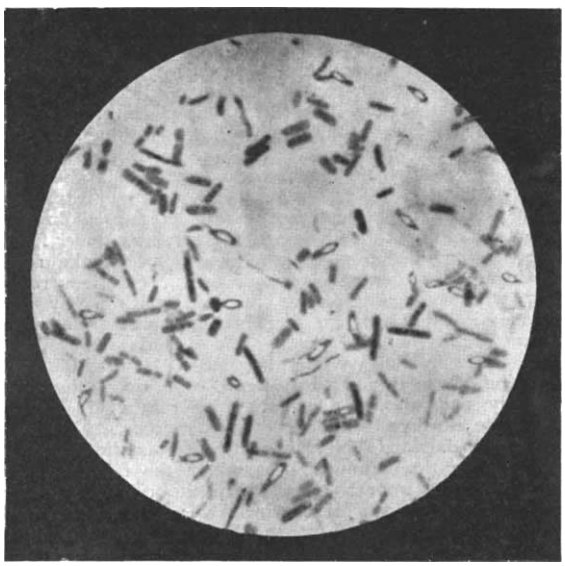

FIG. 1.—Bacillus of Louping-ill in peritoneal liquid of sheep, showing the rods, some without spores, others with spores in their interior. × 1000 diameters.

showing no lesions, and inoculations of the blood, &c., failed to convey the disease from one sheep to another. At last, examination of the fluid in the peritoneal cavity revealed the presence of a large sporing anærobic bacillus (Fig. 1), which, on inoculation into healthy sheep, conveyed the disease again and again. It was for a long time an enigma how this bacillus reached the peritoneal cavity, the blood and tissues being free from it. Eventually, however, in a diseased lamb the intestine was found to be swarming with the bacillus, and a long series of experiments proved that the organisms or their spores are taken in with the food, and if at the susceptible period of the year induce the disease in a large proportion of cases. The organism, being passed with the dejecta, fouls the pasture, and so the disease is propagated. Precisely the same holds good for braxy, which, however, is caused by an organism different from the louping-ill bacillus, the braxy organism being also an anærobic sporing bacillus, but being much smaller and more delicate than the louping-ill bacillus (Fig. 2).

Attempts to immunise by means of injections of attenuated organisms or by chemical products of the organisms proved not only failures, but dangerous on account of the mortality. Taking into account the fact that the organisms are intestinal, the happy idea of drenching the animals with cultures during the insusceptible period was adopted, and proved a decided success on the large scale. Thus, with louping-ill, 1340 sheep were treated in this manner, and a single doubtful death from the disease occurred; with braxy, 1545 sheep were treated, and there were nine possible (three being doubtful) deaths from braxy among them.

A remarkable discovery was made with regard to the seasonal susceptibility and immunity. It was found that during the period of immunity the blood of the sheep proved highly bactericidal towards the louping-ill and braxy bacilli, while during the susceptible period the bacilli were not only not destroyed by, but grew well in, the sheep's blood.

As already indicated, the diseases are mostly communicated by the fouling of the pastures by the dejecta. It has been held by some that the sheep-tick plays a part in their transmission, but experiments showed that this could only be to a very insignificant extent.

The report, which is illustrated with a number of figures and maps, is highly suggestive in many directions; the researches made promise to throw new light on the pathology of many of the contagious and infectious maladies of man and the lower animals, and we congratulate Prof. Hamilton and his collaborators on the valuable work they have done.

R. T. HEWLETT.

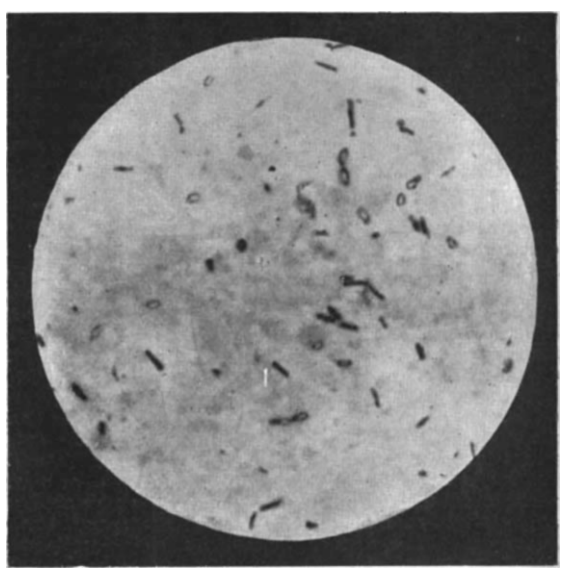

FIG. 2.—Bacillus of Braxy, peritoneal liquid of sheep, showing the comparatively delicate rods, some sporing, others not; those sporing have an oval or lanceolate form. × 1000 diameters.

THE NEW MUSPRATT LABORATORY OF PHYSICAL AND ELECTROCHEMISTRY AT THE UNIVERSITY OF LIVERPOOL.

THE laboratory of physical and electrochemistry, which the University of Liverpool owes to the munificent generosity of Mr. E. K. Muspratt, president of the council of the University, was formally opened by Sir William Ramsay, K.C.B., F.R.S., on Saturday, October 13. The distinguished company which assembled in Liverpool for the occasion included, amongst others, the following well-known men of science from abroad:—Prof. Ostwald (Leipzig), Prof. R. Abegg (Breslau), Prof. Ernst Cohen (Utrecht), Prof. H. Goldschmidt (Christiania), Prof. Lash Miller (Toronto), and Prof. Macallum (Toronto).

On Saturday forenoon the guests inspected the new laboratory privately, and were afterwards entertained to lunch by Sir John Brunner, Bart., M.P., at the University Club, many other prominent men of science and letters in

Liverpool being also present. At 3 o'clock the opening ceremony took place in the arts theatre of the University, a large and distinguished company being present. Mr. E. K. Muspratt formally presented the new laboratory to the University, and in a very interesting speech expressed his conviction that physical chemistry was that branch of chemistry which was most likely to advance knowledge at the present time. Sir John Brunner had founded the chair of physical chemistry at Liverpool. In order to complete this valuable gift a laboratory was necessary, and so he (Mr. Muspratt) had resolved to build and equip a laboratory of physical and electrochemistry. He was glad to see that a considerable number of rooms had been reserved for research work in the new building. He wished to emphasise in the strongest manner the necessity of research being most actively carried out in the University. He was convinced of the importance of electrochemistry, and so he had taken care that the new laboratory should have an adequate electrical equipment.

Vice-Chancellor A. W. W. Dale formally received Mr. Muspratt's gift on behalf of the University, the Earl of Derby, Chancellor of the University, not being able to be present. The Vice-Chancellor referred in glowing terms to the liberality and generosity of Mr. E. K. Muspratt, who had already increased his original gift of 10,000*l.* to something like 14,000*l.* Sir W. Ramsay, in an interesting address, dealt with the paramount necessity of cultivating the "troublesome habit of thinking," as against the subconscious or semi-unconscious processes of brain action. It was the duty of the University to strive with all its power to induce young men to cultivate independent thought. A man might be a walking dictionary, but, if he was, he had all the defects of a dictionary—the words were there, but they formed disconnected and desultory reading. The power to be desired was not specially to remember the words, but to build them up into living sentences. The chief duty of a chair of physical chemistry was to teach men to think for themselves. He would advise that as soon as might be the student of that fascinating subject should be induced by example, precept, sympathy, exhortation, and by all means whereby young human minds could be influenced, to extend the bounds of their subject.

After Sir John Brunner had moved a vote of thanks to Sir W. Ramsay for his very interesting address, which was seconded by Prof. Donnan, the company adjourned to inspect the new laboratory. At five o'clock Prof. Ostwald delivered a highly original and interesting address on the fundamental principles of chemistry, in which he showed that the phases occurring in nature are all solutions, and that the concepts of pure substances are only ideal limiting cases. In fact, a "pure" substance was simply a phase which, within certain limits, boiled or froze at a constant temperature. It was an artificial product. In the evening the guests of the University were entertained to dinner at the University Club by the Liverpool section of the Society of Chemical Industry.

The following brief description of the new laboratory may be of interest to the readers of NATURE. The building, which is connected with the main chemical institute, contains a basement, ground, first, and second floors. The basement includes a dynamo room, battery room, furnace room, store, and a research room for six students. The generating plant consists of motor-generators driven off the city mains at 460 volts, and comprises a 30-kilowatt direct-current generator supplying current at 80–100 volts, a 10-kilowatt charging set consisting of two machines on the same axis each giving 250 amperes at 20 volts, and an 80-kilowatt alternator with two windings to give 1000 amperes at 80 volts or 500 amperes at 150 volts. The charging set is employed to charge in sections a battery of thirty-six Tudor cells, divided up into six sets of six cells, so that different floors or rooms may have the use of separate sets. Vertical cables carry the current from the machines and accumulators to four distributing exchange-boards (one on each floor), whence run circuits (to carry 50 amperes) to the working benches. It is possible by means of flexible connections to connect up on the exchange-board the terminals at each working bench with the required voltage. From the battery switch-board three wires run to each of three exchange-boards, the arrangement being such that each of the latter is supplied with current at 4, 8 and 12 volts from a different set of cells. Specially heavy cables and terminals are arranged to permit of employing 1000 amperes (direct or alternating) in the basement furnace room. The ground floor contains a lecture room with accommodation for about ninety students, a preparation room, library, workshop, and photographic room. The second floor contains a junior laboratory to hold twenty-one students, a balance and switch room, an optical room, a room for three advanced students, research room for a member of the staff, and an instrument store room. The second floor comprises a senior laboratory for eight students, a balance and switch room, and four research rooms. On the roof there is a lavatory, a distillation room, and arrangements for carrying out work in the open air.

All working benches are supplied with gas, water, and electricity. The current is carried by uninsulated wire run on the walls and ceilings by means of wooden battens and porcelain insulators, and terminating in slate panels fixed on wooden battens above the working benches. Close to each bench is a fire-proof slab constructed of compressed red Ruabon tiles set in cement. Each centre bench carries a sink at one end and a thermostat at the other.

The architects of the building are Messrs. Willink and Thicknesse, Castle Street, Liverpool.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—Prof. Somerville, Sibthorpian professor of rural economy, has been elected to a fellowship at St. John's College.

Mr. J. E. Marsh, F.R.S., Balliol College, has been elected to a fellowship at Merton College.

Scholarship examinations in natural science have been announced for the following dates:—December 4, Balliol, Christ Church, and Trinity Colleges; December 11, University, Magdalen, and Lincoln Colleges; January 15, 1907, Jesus College.

CAMBRIDGE.—Dr. G. H. F. Nuttall, F.R.S., fellow of Christ's College, and university lecturer in hygiene, has been appointed the first Quick professor of biology; until the Senate shall otherwise determine, "to devote himself to the study of the Protozoa, especially such as cause disease, and generally to promote that branch of study." Owing to the terms of the will of the late Frederick James Quick, the professorship is not tenable for more than three years without re-election.

The voting on the proposed changes in the mathematical tripos will take place at 2 p.m. on Thursday, October 25.

The Government of India has awarded Mr. A. R. Brown, "Anthony Wilkin" student in ethnology and archæology, the sum of 300*l.* to assist him in carrying on his researches amongst the natives of Andaman and Nicobar Islands.

Mr. H. Yule Oldham, the reader in geography, will give a course of public lectures this term on the history of geographical discovery, on Thursdays at 5 p.m., beginning to-day, in the Sedgwick Museum.

The Clerk Maxwell scholarship is vacant by the resignation of Mr. O. W. Richardson, who has accepted a professorship at Princeton, New Jersey. Candidates for the scholarship should send their applications to Prof. J. J. Thomson.

MR. J. W. MCBAIN has been appointed lecturer in chemistry at University College, Bristol. Mr. McBain is a graduate of the University of Toronto, and has also studied for several years in Germany.

NEW physical and engineering laboratories were opened at Edinburgh University on Tuesday. Mr. Balfour presided over the ceremony, and an address on the progress of scientific research was given by Mr. Andrew Carnegie.

THE *British Medical Journal* states that the authorities of the Victoria University, Manchester, have received a sum of 5000*l.* from the trustees appointed under the will of the late Miss Middleton, and have allocated this amount towards the endowment of the chair of anatomy.